Small Business Innovation Research/Small Business Tech Transfer

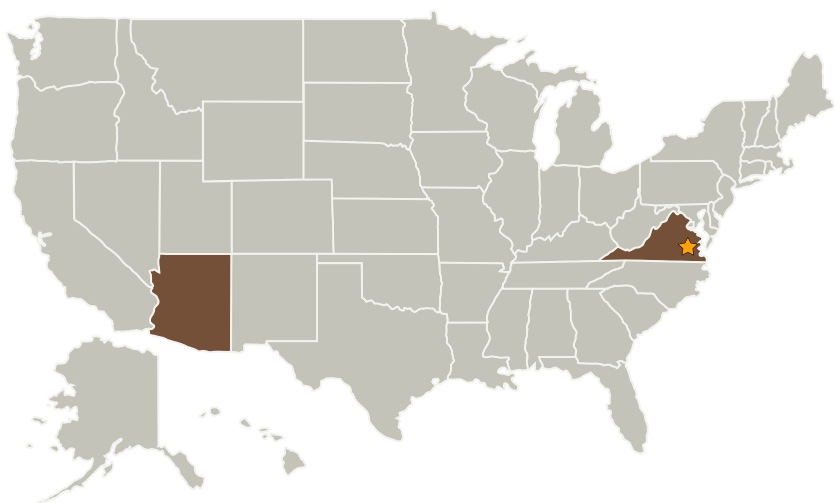
Unified Nonlinear Flight Dynamics and Aeroelastic Simulator Tool, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

ZONA Technology, Inc. (ZONA) proposes a R&D effort to develop a Unified Nonlinear Flight Dynamics and Aeroelastic Simulator (UNFDAS) Tool that will combine proven simulation and visualization techniques to accurately match in-flight recorded dynamic behavior of an air vehicle. ZONA proposes to develop the UNFDAS Tool through a blend of state-of-the-art aerodynamic model updating and control-oriented techniques. It blends mathematically sound flight dynamics and aeroelastic modeling approaches with CFD, wind-tunnel or flight-test data. The end product is a nonlinear dynamic tool capable of simulating the key aeroelastic coupling mechanism between structural modes and unsteady aerodynamic effects with classical rigid-body dynamics. Feasibility studies are proposed to validate the UNFDAS Tool using a suite of actual data from flying qualities and flutter flight tests. This enabling technology will be invaluable to the flight test community by accurately simulating the air vehicle responses to different input commands, and then identifying the critical flying conditions before actual flights are performed. Marketing the resulting software package will be simplified by taking advantage of ZONA's current extensive customer list. ZONA Technology's reputation and track record in supporting the aerospace industry and government with ZONA codes can assure the success of the commercialization plan.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
ZONA Technology, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Scottsdale, Arizona

Primary U.S. Work Locations	
Arizona	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.2 Flight Mechanics
    - TX15.2.4 Modeling and Simulation for Flight